SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Preliminary Draft Staff Report for

Proposed Amended Rule 1415 – Reduction of Refrigerant Emissions from Stationary Air Conditioning Systems and Proposed Rule 1415.1 - Reduction of Refrigerant Emissions from Stationary Refrigeration Systems

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EXECUTIVE SUMMARY

In December 2009, the California Air Resources Board (CARB) approved the Management of High Global Warming Potential Refrigerants for Stationary Sources regulation (commonly called the Refrigerant Management Program) to help reduce the state's greenhouse gas (GHG) emissions to 1990 levels by year 2020, as required by the California Global Warming Solutions Act of 2006 (AB 32). The regulation will go into effect on January 1, 2011.

The Refrigeration Management Program's goal is to reduce emissions of high global warming potential (GWP) refrigerants such as chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs) used in commercial and industrial refrigeration systems. The regulation requires registration, leak detection and monitoring, leak repair, retrofit or retirement, reporting, and recordkeeping for the affected industries including owners or operators of refrigeration systems, any person who services a refrigeration system, and distributors, wholesalers, and reclaimers of high GWP refrigerants.

Currently, the AQMD has a similar regulation, Rule 1415 – Reduction of Refrigerant Emissions from Stationary Refrigeration and Air Conditioning Systems (Rule 1415), which covers the reduction of ozone depleting refrigerant (CFC and HCFC) emissions. Rule 1415 requirements, however, apply to both stationary refrigeration and air conditioning systems whereas the Refrigeration Management Program covers only stationary refrigeration systems. In certain aspects, the CARB's regulation is more stringent than Rule 1415 particularly when it comes to leak inspection, leak detection and monitoring, and reporting requirements. Staff's goal is to ensure that the AQMD refrigerant rule is equivalent in every aspect to the CARB regulation; therefore, a new Rule 1415.1 – Reduction of Refrigerant Emissions from Stationary Refrigeration Systems (Rule 1415.1) is being proposed to reduce refrigerant emissions from stationary refrigeration systems and to align AQMD's program with CARB's Refrigeration Management Program. Proposed Rule (PR) 1415.1 will adopt all provisions in the state regulation pertaining to the control of high GWP refrigerant emissions.

For Rule 1415, staff is proposing to expand the scope of the rule to include high GWP refrigerants. In addition, staff's proposed amendments to Rule 1415 would place all emission control requirements solely for air conditioning systems under this Rule. Staff believes that having separate rules for air conditioning (PAR 1415) and refrigeration systems (PR 1415.1) would minimize confusion with regard to rule applicability, improve clarity, and enhance rule enforceability.

The CARB Refrigeration Management Program will result in an estimated GHG emission reduction for the South Coast Air Basin of approximately 3.6 MMT CO_2E by year 2020. Implementing PR 1415 is not expected to achieve additional GHG emission reductions beyond what is expected from the CARB regulation.

BACKGROUND

Rule 1415 – Reduction of Refrigerant Emissions from Stationary Refrigeration and Air Conditioning Systems was adopted on June 7, 1991, and later amended on October 14, 1994, to reduce emissions of Class I and Class II ozone-depleting refrigerants from stationary refrigeration

and air conditioning systems. Class I refrigerants are typically CFCs, while Class II refrigerants are all HCFCs, and are listed under section 602 of the Clean Air Act.

Production of CFCs and HCFCs were designated for phase out under the Montreal Protocol, primarily due to concerns about stratospheric ozone depletion. The use of these ozone depleting substances (ODS) as refrigerants is also regulated for the same reason. As a result of the Montreal Protocol's phase-out of ODS, the use of CFCs and HCFCs as refrigerants has been replaced with HFCs and PFCs, generally referred to as ODS substitutes. These ODS substitutes are not ozone depleters, but have much higher global warming potential. The use of ODS substitutes are increasing, and will continue to increase as ODS refrigerants are replaced by these high global warming potential ODS substitutes, particularly the HFCs. Consequently, greenhouse gas (GHG) emissions are projected to increase on a CO_2 equivalent basis.

The increase in GHGs in the atmosphere has been attributed to the average rise in the Earth's temperature that has been observed in recent years, which is commonly referred to as global warming. These GHGs make the Earth warmer by trapping heat from the sun in the earth's atmosphere, which increases the temperature. Many chemical compounds found in the Earth's atmosphere, such as methane, carbon dioxide, nitrous oxide, HCFCs, PFCs, and HFCs, act as GHGs. There is strong evidence that significant amounts of GHGs are added to the atmosphere as a result of human activities, thereby, contributing to global warming. Scientists believe that a warmer Earth may lead to changes in weather patterns, a rise in sea level, and may have significant impacts on plants, wildlife, and humans.

In 2006, the State Legislature passed the California Global Warming Solutions Act of 2006 (AB 32), establishing a comprehensive program to reduce the state's GHG emissions to the 1990 level by year 2020. AB 32 directed CARB to begin developing discrete early action measures to reduce greenhouse gases while also preparing a scoping plan to identify the best approach to reach the 2020 target. In addition, AB 32 requires that any GHG emission reduction measures developed be technologically feasible and cost-effective.

In December 2009, CARB approved the Management of High Global Warming Potential Refrigerants for Stationary Sources regulation, commonly referred to as the Refrigerant Management Program. This program is one of the early action measures adopted by CARB under AB32 aimed at reducing the state's GHG emissions. The regulation will go into effect on January 1, 2011.

The Refrigeration Management Program seeks to reduce emissions of high GWP refrigerants from stationary refrigeration systems. A high-GWP refrigerant is any compound used as a heat transfer fluid or gas, and includes CFCs, HCFCs, HFCs, PFCs, or any compound or blend of compounds with a global warming potential value equal to or greater than 150, or any ozone depleting substance as defined in Title 40 of the Code of Federal Regulation, Part 82, §82.3. These substances are GHGs which are thousands of times more potent than carbon dioxide (CO_2). The CARB regulation addresses stationary commercial and industrial refrigeration systems that can have high leak rates and minimal oversight. Specifically, facilities with refrigeration systems using more than 50 pounds of high GWP refrigerants, or those who service refrigeration systems, or distribute, sell or reclaim high GWP refrigerants, must comply with the regulation.

The CARB regulation requires registration, leak detection and monitoring, leak repair, retrofit or retirement, reporting, and recordkeeping for owners or operators of refrigeration systems subject to the regulation. Reporting and recordkeeping requirements are also applicable to distributors, wholesalers, and reclaimers of high GWP refrigerants. Additionally, required service practices for refrigerant management are applicable to any person who services a refrigeration system that uses a high GWP refrigerant.

The requirements in the CARB Refrigeration Management Program are similar to existing federal regulations under section 608 of the Clean Air Act, particularly in the areas of leak repair, required service practices, and recordkeeping requirements. In addition, the CARB regulation was developed to be as consistent as possible with the current Rule 1415. However, there are certain areas where the existing Rule 1415 differs with the CARB regulation.

While current Rule 1415 applicability is limited to ODS refrigerants, such as CFCs and HCFCs, the CARB Refrigeration Management Program includes both ODS and ODS substitute refrigerants. In addition, Rule 1415 covers both refrigeration and air conditioning systems while the CARB regulation is limited to refrigeration systems only. In certain aspects, the CARB's regulation is more stringent than Rule 1415 particularly when it comes to leak inspection, leak detection and monitoring, and reporting requirements.

Staff's proposal to create a new Rule 1415.1 to control high GWP refrigerant emissions solely from stationary refrigeration systems would align AQMD's regulation with CARB's Refrigeration Management Program. PR 1415.1 will incorporate all provisions in the state regulation to reduce emissions of high global warming potential refrigerants. By proposing Rule 1415.1, AQMD staff can implement or enforce the state's Refrigeration Management Program, which is expected to be done through a Memorandum of Understanding with CARB. The CARB regulation is based largely on what the AQMD has been doing for a long time in controlling refrigerant emissions stationary refrigeration systems.

In addition, the proposed changes to Rule 1415 would place all emission control requirements for air conditioning systems under this rule. Staff believes that proposing separate rules for air conditioning (PAR 1415) and refrigeration systems (PR 1415.1) would minimize confusion with regard to rule applicability, improve clarity, and enhance rule enforceability.

LEGISLATIVE AUTHORITY

The California Legislature created the South Coast Air Quality Management District (AQMD) in 1977 (The Lewis-Presley Air Quality Management Act, Health and Safety Code section 40400 et seq.) as the agency responsible for developing and enforcing air pollution control rules and regulations in the South Coast Air Basin (Basin). The AQMD obtains its authority to adopt, amend, or rescind rules and regulations from Health and Safety Code sections 39002, 40000, 40001, 40702, 41508, and 41700.

RULE PROPOSAL

Proposed Amended Rule 1415 - Reduction of Refrigerant Emissions from Stationary Air Conditioning Systems

Staff's proposal is to amend Rule 1415 to incorporate all registration, emission control, and recordkeeping requirements in the rule solely for stationary air conditioning systems. Staff's proposal will also expand the scope of the current rule to include all high GWP refrigerants, similar to the CARB regulation for stationary refrigeration systems. Other administrative changes to the rule are also proposed. A summary of the proposed amendments to Rule 1415 is as follows:

1. Amend Rule Title

   Currently, the rule title pertains to stationary refrigeration and air conditioning systems. Staff's proposal revises the rule title solely for the reduction of emissions from stationary air conditioning systems, and eliminates reference to refrigeration systems.

2. Modify Rule Purpose and Applicability, subdivisions (a) and (b)

   Staff is proposing to modify the rule purpose to include emission reductions from high global warming potential refrigerants, and limit the applicability of this to stationary air conditioning systems only. Requirements pertaining to stationary refrigeration systems such as refrigerators, freezers, and other refrigeration appliances will be in the Proposed Rule 1415.1 – Reduction of Refrigerant Emissions from Stationary Refrigeration Systems.

3. Amend the definition section, subdivision (c)

   Staff proposes to add definition for new terms used in the rule and modify existing ones to clarify rule intent as follows:

   - Additional refrigerant charge
   - Air conditioning system
   - Audit
   - Certified reclaimer
   - Certified refrigerant recovery or recycling equipment
   - Certified technician
   - Chlorofluorocarbon
   - High global warming potential refrigerant
   - Hydrochlorofluorocarbon
   - Hydrofluorocarbon
   - Perfluorocarbon

- Reclaim
- Recycle
- Refrigerant leak
- Self-contained recovery equipment

In addition, staff is proposing to delete terms that are no longer applicable as follows:

- Approved recycling equipment
- Certified auditor
- Class I refrigerant
- Class II refrigerant
- High-pressure refrigeration system
- Low-pressure refrigeration system
- Maintenance
- Refrigeration system
- Very high pressure refrigeration system

4. Move requirements in paragraph (d)(2) to paragraph (d)(1), and clarify requirements that pertain to owners or operators of air conditioning systems as follows:
    a) Registration Plan requirement in (d)(2)(C) is moved to (d)(1)(A). Further, staff has added new information to be included in the Registration Plan consistent with existing data required in the current Rule 1415 Registration Form.
    b) Audit requirements in (d)(2)(A) and (d)(2)(B) are consolidated under (d)(1)(B). Language pertaining to leak test methods has been modified to reflect current industry practices.
    c) Delete redundant recordkeeping requirement in (d)(2)(B)(ii). This requirement is included in paragraph (e)(1).

5. Move leak repair requirements in paragraph (d)(3) to (d)(2).

6. Move requirements in paragraph (d)(1) to paragraph (d)(3). In addition, language is proposed in (d)(3)(A) to clarify the U.S. EPA certified technician requirement.

7. Move language in paragraph (e)(5), under Recordkeeping section, to subparagraph (d)(4)(B) under Requirements section, which allows an authorized representative of a person employing at least one certified technician to purchase refrigerant. Consequently, similar language in paragraph (e)(5) is proposed for deletion.

8. Modify language in subparagraph (d)(5) to clarify rule intent and enhance rule enforceability. In addition, staff is proposing to delete obsolete rule language in (e)(1)(iv) and (e)(8)(D) pertaining to permit number requirement for refrigerant recovery and

recycling equipment. Such equipment is now exempt from permit requirements pursuant to Rule 219 (d)(11).

Proposed Rule 1415.1 - Reduction of Refrigerant Emissions from Stationary Refrigeration Systems

As stated in the previous section, Proposed Rule 1415.1 mirrors CARB's Refrigeration Management Program, and will implement all provisions in the state regulation to reduce emissions of high GWP refrigerants. Staff is proposing to incorporate the following provisions pertaining to stationary refrigeration systems in Rule 1415.1:

1. Rule Title

   Staff's proposed rule title is specific to the reduction of refrigerant emissions from stationary refrigeration systems only.

2. Purpose and Applicability

   The scope and applicability is for high GWP refrigerants used in stationary refrigeration systems.

3. Definitions

   Staff is proposing 49 definitions for terms used in the rule in order to clarify rule intent and enhance rule enforceability. These definitions are consistent with those found in the CARB Refrigeration Management Program.

4. Registration Requirements, paragraph (d)(1)

   Staff is proposing that owners and operators of refrigeration systems with full charge greater than 50 lbs of high GWP refrigerant submit annually a Registration Plan to the District. However, registration with the District ceases once the CARB registration requirements for the refrigeration system begins. Registration of the refrigeration system with CARB will be required in 2012 for large refrigeration systems (full charge greater than or equal to 2,000 lbs refrigerant); 2014 for medium-sized refrigeration systems (full charge greater than 200 lbs but less than 2,000 lbs refrigerant); and 2016 for small refrigeration systems (full charge greater than 50 lbs but less than 200 lbs refrigerant), based on the largest refrigeration full charge operating at the facility. For example, if a facility has a refrigeration system with a refrigerant full charge of 2,500 lbs and another system with a refrigerant full charge of 800 lbs, the facility will have to register both refrigeration systems by year 2012 (the registration deadline for systems with full charge greater than 2,000 lbs of refrigerant), even though registration of an 800-lb refrigeration system would not be due until year 2014 if it was the largest or only system at the facility.

   The proposed registration provision also includes information that facilities need to provide about the refrigeration systems during registration, and a provision requiring initial and annual implementation fees to cover the costs of administering and enforcing the rule based on fee guidelines established by CARB. Currently, CARB's initial and annual implementation fees for large refrigeration systems (full charge greater than or

equal to 2,000 lbs refrigerant) are both set at $370 per facility, and $170 per facility for medium-sized refrigeration systems (full charge greater than or equal to 200 lbs but less than 2,000 lbs refrigerant). Additionally, the proposal includes change of ownership requirements for refrigeration systems previously registered with CARB.

5. Leak Detection and Monitoring Requirements, paragraph (d)(2)

   The proposed requirements incorporate CARB's regulation on leak inspection and monitoring. Beginning January 1, 2011, owners or operators of large refrigeration systems (full charge greater than or equal to 2,000 lbs refrigerant) are required to conduct monthly leak inspections. Quarterly leak inspections are required for medium-sized refrigeration systems (full charge greater than or equal to 200 lbs but less than 2,000 lbs refrigerant), while small refrigeration systems (full charge greater than 50 lbs but less than 200 lbs refrigerant) will be required annual leak inspections. These leak inspection requirements do not apply if the refrigeration system has an automatic leak detection system. In comparison, current Rule 1415 requires an annual leak inspection regardless of the size of the refrigeration system, considered to be less stringent for large and medium-sized refrigeration systems.

   In addition, the proposal will require the installation of an automatic leak detection system for large refrigeration systems beginning in year 2012. Leak inspection methods consistent with industry practice are also being proposed.

6. Leak Repair Requirements, paragraph (d)(3)

   Consistent with Rule 1415, the proposal will require the repair of a refrigerant leak within 14 days of initial leak detection. In order to be consistent with the CARB regulation, however, PR 1415.1 will allow longer repair periods of 45 days and 120 days depending on the nature of the refrigeration system, and the circumstances surrounding the leak. For example, if a certified technician or a part needed to repair the refrigerant leak is not available within 14 days of initial leak detection, or the leak repair requires an industrial shutdown, then additional time to complete the repair may be allowed up to 45 days from leak detection. Further, facilities that are subject to the Mandatory Greenhouse Gas Emissions Reporting requirements under section 101 of the California Code of Regulations may qualify for a 120-day repair period. Such facilities include cement plants, electrical generating facilities, electricity retail providers and power marketers, oil refineries, hydrogen plants, cogeneration facilities, and industrial sources that emit more than 25,000 MT CO_2 per year.

   The proposal will also require the owner or operator to prepare and implement a retrofit and retirement plan if the refrigerant leak cannot be repaired within the allowable repair period of 14, 45, or 120 days.

7. Retrofit or Retirement Plan Requirements, paragraph (d)(4)

   The proposed provision will require the owners or operators of refrigeration systems that continue to leak to establish a schedule to retrofit or retire the system within six months of initial leak detection. This section also includes specific information that needs to be

included in the plan pertaining to the facility and to the retrofitted or newly installed refrigeration system.

The retrofit or retirement plan is not required to be submitted to the Executive Officer, but needs to be maintained and kept at the facility.

8. Approval of Exemptions, paragraph (d)(5)

   This rule provision outlines specific conditions upon which a facility may be exempted from the leak repair and retrofit/retirement plan requirements for up to three years. Such a provision allows flexibility in rule implementation to address significant hardship as a result of complying with the leak repair and retrofit/retirement plan requirements in the rule. Facility owners or operators need to submit a written application to the Executive Officer demonstrating that one or more of the exemption criteria have been met.

9. Prohibitions, subdivision (e)

   Staff is proposing specific prohibitions pertaining to the installation, service, or repair of refrigeration systems; the operation of certified refrigerant recovery or recycling equipment; and sale, use and disposal of refrigerants. Some of the requirements include the mandatory use of U.S. EPA certified technician for service or repair of refrigeration systems; recovery and recycling of refrigerant and the use of certified refrigerant recovery and recycling equipment during leak repair; and restrictions on the sale of refrigerants. Most of these prohibitions are already part of the requirements in the current Rule 1415.

10. Reporting Requirements, subdivision (f)

    Staff's proposal includes reporting requirements for owners or operators of refrigeration systems, including refrigerant distributors, wholesalers, and reclaimers. Specifically, owners or operators of large and medium-sized systems are required to submit annually a Facility Stationary Refrigeration Report (Annual Report). Reporting is not required for facilities with small refrigeration systems.

    Submission of the Annual Report begins in year 2012 for large refrigeration systems and year 2014 for medium-sized refrigeration systems. The Annual Report contains information about the refrigeration system such as equipment type and model, specific data on refrigeration system service and leak repairs, as well as refrigerant purchases and use information.

    Refrigerant distributors or wholesalers are also required to report annually specific information on refrigerants that was purchased for resale, refrigerants sold, or shipped to a certified reclaimer. In addition, certified reclaimers are required to submit an annual report on the amount of refrigerant received for reclamation or destruction, the amount of refrigerant reclaimed, or the amount of refrigerant shipped outside of California for reclamation or destruction.

11. Recordkeeping Requirements, subdivision (g)

This section describes recordkeeping requirements for facilities with stationary refrigeration systems, refrigerant wholesalers or distributors, refrigerant reclaimers, and persons owning and operating a certified refrigerant recovery or recycling equipment.

12. Exemption Section, subdivision (h)

    Staff is proposing to add exemption provisions in the rule as follows:

    a. Exemption for tactical support equipment, as defined in paragraph (c)(49);

    b. Criteria for fee exemption;

    c. Conditions for exemption from leak repair and retrofit/retirement plan requirements; and

    d. Exemption from the contractor's license requirements.

13. Section Pertaining to Violations, subdivision (i)

    This subdivision clarifies enforcement actions for failure to comply with the provisions of the rule.

EMISSIONS INVENTORY AND REDUCTIONS

The emissions inventory for high GWP refrigerants used in stationary refrigeration system was developed by CARB using several models. First, CARB utilized the United States Environmental Protection Agency (U.S. EPA) Vintage Model in determining national GHG emissions estimates for years 2010-2020. This model was developed to estimate nationwide patterns of GHG emissions of HFCs, PFCs, CFCs, and HCFCs from all major emission sources, including refrigerant usage.

In order to get a rough estimate of statewide GHG emissions from stationary refrigeration and air conditioning units, CARB scaled down the national estimates from the U.S. EPA Vintage Model to California's proportion of the U.S. population of 12.5%. In addition, CARB used additional California-specific data sources to further refine the emissions estimates and establish a more accurate year 2010 baseline emissions for California, with year 2020 as the initial target date for AB 32 measures. Details of CARB's methodology for estimating statewide GHG emissions inventory are discussed in Appendix B of CARB's Initial Statement of Reasons for Proposed Regulation for the Management of High Global Warming Potential Refrigerants for Stationary Sources, dated October 23, 2009.

The following table shows the number of facilities statewide with stationary refrigeration systems with refrigerant full charge of at least 50 pounds, including year 2010 baseline business-as-usual (BAU) GHG emissions and projected BAU emissions for year 2020. The total statewide GHG emission reduction by year 2020 from implementing the Refrigeration Management program is about 8.1 MMT CO_2E per year.

[1]Statewide Commercial Refrigeration Systems with Full Charge Greater Than or Equal to 50 lbs.					
		Emissions in Million Metric Tons CO_2 Equivalent ($MMTCO_2E$)			
Equipment Size	Number of Facilities	2010 BAU Emissions	2020 BAU Emissions	2020 Total GHG Emission Reductions	2020 Post Rule Emissions
Small Commercial (50 to <200)	15,500	1.2	1.4	0.9	0.5
Medium Commercial (200 to <2000)	8,500	5.7	7.9	3.3	4.6
Large Commercial	2,000	5.0	6.5	3.9	2.6
Total	26,000	11.9	15.8	8.1	7.7

[1] Appendix B of CARB's Initial Statement of Reasons for Proposed Regulation for the Management of High Global Warming Potential Refrigerants for Stationary Sources, dated October 23, 2009

Following CARB's methodology, the statewide emissions inventory is scaled down to South Coast Air Basin's proportion of the state population of 45% to determine GHG emissions for the South Coast Air Basin. As a result, the year 2010 baseline BAU GHG emissions for the South Coast Air Basin is estimated at 5.4 $MMTCO_2E$, and year 2020 BAU GHG emissions is about 7.1 $MMTCO_2E$. The total GHG emission reduction for the South Coast Air Basin portion is approximately 3.6 $MMTCO_2E$ by year 2020. However, this is not an incremental emission reduction from Proposed Rule 1415.1, but rather reflects the projected GHG emission reductions as a result of CARB's Refrigeration Management Program; therefore, there is no additional emission reduction associated with Proposed Rule 1415.1.

Additionally, there is no emission reduction expected from PAR 1415 because the proposed changes are administrative in nature.

COST

Beginning January 1, 2011, facilities with refrigeration systems with full charge greater than 50 pounds of high global warming potential refrigerants have to comply with CARB's regulation for the management of high global warming potential refrigerants or generally referred to as the Refrigerant Management Program, and would incur additional cost to comply with the CARB regulation. Staff's proposal is administrative in nature and is designed to make the District's refrigerant rule equivalent to and consistent with the CARB regulation. Compliance with PR 1415.1 will not incur additional cost beyond what is expected of facilities for complying with the CARB Refrigerant Management Program; therefore, PR 1415.1 does not impose additional cost to the affected industry.

It is worthwhile to note that CARB's cost evaluation of the Refrigerant Management Program indicates that owners or operators of refrigeration systems can benefit financially through implementation of the refrigerant best management practices required in the regulation. Such practices would reduce refrigerant purchases needed to replenish the refrigerant that had leaked and, thus, result in cost savings to the owners or operators of refrigeration systems. Details of the Refrigeration Management Program's cost analysis are contained in Appendix C of CARB's Initial Statement of Reasons for Proposed Regulation for the Management of High Global Warming Potential Refrigerants for Stationary Sources, dated October 23, 2009.

For PAR 1415, staff's proposal will also require registration of air conditioning systems using high GWP refrigerants other than CFCs and HCFCs, such as HFCs and PFCs. Based on CARB's inventory, it is estimated that about 2,000 stationary air conditioning units using HFCs and PFCs in the South Coast Air Basin will be affected by the registration requirements in PAR 1415. Based on the current fee schedule for Rule 1415 Registration Plan, the estimated compliance cost industry-wide will be $115,000 annually.